IV. "On Evaporation and Dissociation. Part I." By Professor WILLIAM RAMSAY, Ph.D., and SYDNEY YOUNG, D.Sc., Lecturer and Demonstrator of Chemistry in University College, Bristol. Communicated by Professor STOKES, Sec. R.S. Received August 4, 1885.

(Abstract.)

The authors describe experiments made with the object of ascertaining whether the coincidence of the curves which represent the vapour-pressures of stable solid and liquid substances at different temperatures, with those indicating the maximum temperatures attainable by the same substances at different pressures, when evaporating with a free surface, holds good also for bodies which dissociate in their passage to the gaseous state. The substances examined were chloral hydrate, chloral methyl, and ethyl alcoholates, butyl chloral hydrate, ammonium carbonate, ammonium chloride, aldehyde ammonia, phthalic acid, succinic acid, nitric peroxide, and acetic acid.

These substances fall into two classes, the first including bodies giving coincident curves, viz., nitric peroxide, ammonium chloride, and acetic acid, the second containing the remaining substances, which do not show such coincidence. Comparing the members of the second class with each other as regards temperatures of volatilisation, it is found that in those cases in which dissociation is complete, or nearly so, the temperatures of volatilisation are independent of pressure and do not form a curve. When dissociation is less complete, as with succinic and phthalic acids, a rudimentary curve is observable, and with aldehyde ammonia, which is much more stable, the temperatures of volatilisation form a regular curve resembling a vapour-pressure curve.

All those substances, however, give curves representing pressures of dissociation, generally similar in form to vapour-pressure curves, and a comparison of these curves with those representing temperatures of volatilisation would indicate that the smaller the amount of dissociation the nearer the curves approach each other both in form and position.

It is noticeable that in the formation of bodies of the second class a molecule of water or ammonia is invariably broken down, whereas with nitric peroxide and acetic acid direct union of like molecules takes place, and there is no such rupture as in the previous cases. As ammonium chloride resembles these substances in the likeness of their behaviour to that of stable solids and liquids, it may perhaps be

conjectured that the molecule of hydrogen chloride is not broken down in its union with ammonia to form ammonium chloride. Should this conjecture not be accepted as correct, it will be necessary to seek for an explanation of the phenomena observed by some relations yet to be discovered.

V. "On the Phenomena accompanying Stimulation of the Gland-Cells in the Tentacles of *Drosera dichotoma*." By WALTER GARDINER, M.A., Fellow of Clare College, Cambridge, Demonstrator of Botany in the University. Communicated by Professor M. FOSTER, Sec. R.S. Received September 5, 1885.

(Preliminary Communication.)

Method of Research.—Pieces of unstimulated leaves, and of leaves stimulated for periods varying from 5 minutes to 72 hours, were examined fresh, or after treatment with alcohol, picric acid, chromic acid, or osmic acid. The most satisfactory results were obtained from specimens treated for 12 hours with 1 and 2 per cent. chromic acid; such strengths dissolving the tannin precipitate first formed, and fixing the structures most successfully. The leaves were fed principally upon small flies or pieces of frog muscle, since these were found to succeed best. Heat stimuli, electrical stimuli, and stimulus produced by contact or cutting were also employed.

General Histology.—As regards the general histology of the tentacles, one may notice that the gland-cells of the head are provided with delicate uncuticularised cell-walls, which are remarkably pitted on their upper or free surfaces; that the rest of the epidermal cells of the tentacles have their exterior walls excessively cuticularised and resistant, and that their radial longitudinal walls are freely pitted.

Structure of the Resting Gland-Cells.—In the typical resting gland-cell, the protoplasm is arranged in a network or reticulum. The meshes of this reticulum are excessively close around the nucleus, which is situated at the base of the cell, but towards the free surface they are much more open; the close and more open arrangement merging the one into the other. The meshwork extends through the whole of the cell cavity, and the interstices between the meshes are occupied by the pink cell sap; the whole being bounded by the ectoplasm. The gland-cells at the base of the head differ somewhat in structure from the more apical cells, as also do all the cells of the short stalked tentacles which are situated at the centre of the leaf. In neither of the three layers of cells covering the tracheïdal cells of the head could any obvious movement of the protoplasm be detected.